

LAWRENCE LIVERMORE REPORT

A weekly collection of scientific and technological achievements from Lawrence Livermore National Laboratory: July 21-28, 2008.

Protecting the Earth from killer asteroids

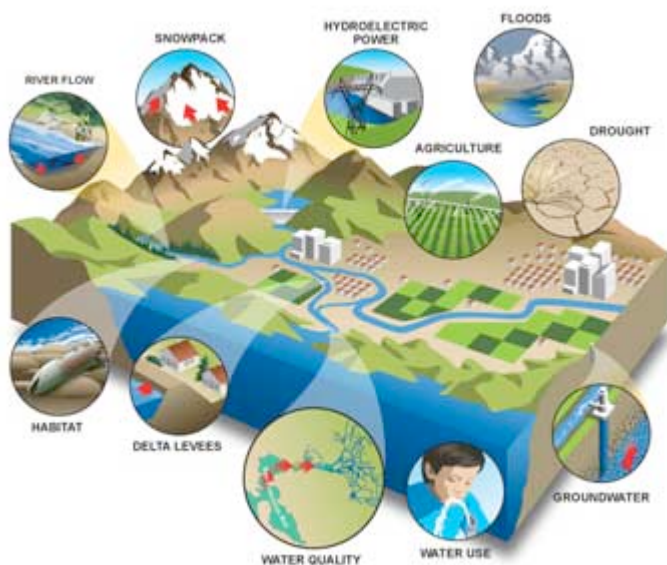


An estimated 10 million rocky asteroids and ice-and-dirt comets pirouette in outer space, and once in a while their paths fatefully intersect our planet's. Most notorious was the titan, six miles in diameter, that plunged into the Gulf of Mexico around 65 million years ago, releasing thousands of times more energy than all the nuclear weapons on the planet combined. Three-quarters of all life-forms, including the dinosaurs, were wiped out.

What can we do to avert a catastrophe the next time around? A team of scientists, including Lawrence Livermore physicist Dave Dearborn, discussed the possibilities in the August issue of *National Geographic*. The article marks the 100th anniversary of the Tunguska event, when an object the size of a 15-story building fell in Siberia, and notes that objects this size crash into Earth every few centuries or so.

For more, see <http://ngm.nationalgeographic.com/2008/08/earth-scars/stone-text/1>

Lab scientist testifies on threats to state water supply



Lawrence Livermore atmospheric scientist Phil Duffy testified at a congressional hearing on the federal response to the California drought emergency last week. The hearing, before the House Subcommittee on Water and Power, was held in Fresno.

Duffy discussed how California's water supply is highly vulnerable to climate change. "Observations in California and much of the Western United States show trends that are not only consistent with global warming, but inconsistent with natural climate variability," he said. "Furthermore, these trends, if continued, will reduce the reliability of California's water supply, and will likely have other important impacts."

State officials already are preparing for another year of drought in 2009, prompted by: low reservoir storage levels because of the last two dry years; court-ordered cutbacks that limit pumping because of harm to an endangered species; increasing demand for water; and forecasts of another dry winter.

For more, see https://newsline.llnl.gov/articles/2008/jul/07.25.08_water.php

NNSA continues to remove weapons material



A sizable amount of fissile material has been removed from nuclear weapons sites across the country this fiscal year, including Lawrence Livermore National Laboratory.

With the completion of a recent shipment from the Y-12 National Security Complex, 12 metric tons (or more than 26,000 pounds) of plutonium and highly enriched uranium (HEU) are now on the path to disposition, when it will no longer be able to be used in a nuclear weapon.

The bulk of the material consists of HEU from Y-12 in Tennessee. At LLNL, the inventory of special nuclear materials has been reduced by 25 percent, while Sandia National Laboratories has removed its total inventory of materials requiring the highest level of security protection.

Some of this material goes to other NNSA sites, but much of the surplus plutonium from LLNL is sent to the Savannah River Site in South Carolina. The material could be turned into fuel at the Mixed Oxide (MOX) Fuel Fabrication Facility, pending future decisions.

For more, see https://newsline.llnl.gov/articles/2008/jul/07.25.08_nuclear.php

Brain and brawn

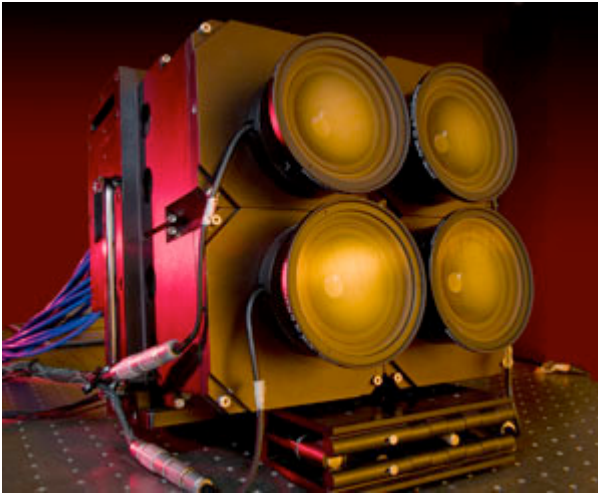


When Rob Meulenberg is at work, the only hint you get about his second life is the blender and can of protein powder on top of the shelf that holds his calculus books.

By day, the 31-year-old is a Lawrence Livermore chemist who studies the nature of tiny atom particles. Evenings and weekends, the 5-foot-11, 291-pound Meulenberg spends his time working out, preparing for strongman competitions that have him lifting as much as 800 pounds or singlehandedly towing trucks.

For more, see the *Contra Costa Times* story and video at http://www.contracostatimes.com/search/ci_9952472?IADID=Search-www.contracostatimes.com-www.contracostatimes.com

Photo of the week



Souped-up surveillance -- The Sonoma Persistent Surveillance System, an R&D 100 award-winning technology, can provide continuous real-time video imagery of an area the size of a small city with a resolution fine enough to track 8,000 moving objects in its field of view.

Photographer: Jacqueline McBride/LLNL

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LLNL applies and advances science and technology to help ensure national security and global stability. Through multi-disciplinary research and development, with particular expertise in high-energy-density physics, laser science, high-performance computing and science/engineering at the nanometer/subpicosecond scale, LLNL innovations improve security, meet energy and environmental needs and strengthen U.S. economic competitiveness. The Laboratory also partners with other research institutions, universities and industry to bring the full weight of the nation's science and technology community to bear on solving problems of national importance.

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The Livermore Lab Report archive, including today's issue, is available at: https://publicaffairs.llnl.gov/news/lab_report/2008index.html